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SUMMARIES OF ARTICLES.

[ABBREVIATIONS.—*Am. J. Ps.* = *The American Journal of Psychology; Ar. de Ps.* = *Archives de Psychologie; Ar. f. G. Ph.* = *Archiv für Geschichte der Philosophie; Ar. f. sys. Ph.* = *Archiv für systematische Philosophie; Br. J. Ps.* = *The British Journal of Psychology; Int. J. E.* = *International Journal of Ethics; J. of Ph., Psy., and Sci. Meth.* = *The Journal of Philosophy, Psychology, and Scientific Methods; J. de Psych.* = *Journal de Psychologie; Psych. Bul.* = *Psychological Bulletin; Psych. Rev.* = *Psychological Review; Rev. de Mét.* = *Revue de Métaphysique et de Morale; Rev. Néo-Sc.* = *Revue Néo-Scolastique; Rev. Ph.* = *Revue Philosophique; Rev. de Ph.* = *Revue de Philosophie; R. d. Fil.* = *Rivista di Filosofia; V. f. w. Ph.* = *Vierteljahrsschrift für wissenschaftliche Philosophie; Z. f. Ph. u. ph. Kr.* = *Zeitschrift für Philosophie und philosophische Kritik; Z. f. Psych.* = *Zeitschrift für Psychologie und Physiologie der Sinnesorgane, I. Abtl. Zeitschrift für Psychologie.*—Other titles are self-explanatory.]

De la méthode en histoire de la philosophie. V. DELBOS. Rev. de Mét., XXIV, 4, pp. 369–382. (II, Analysis and Reconstruction of Doctrines.)

If we had before us the complete, authentic works of a philosopher, and wished to analyze his system for the purpose of reconstructing it in a form conveniently adapted for communication, we might proceed on a very simple rule. We might read his meaning literally from the very words he uses. But this is a very difficult task when the philosophy we are studying is of a scientific nature, or possesses any degree of originality. Any special enquiry of importance involves a departure from the common use of terms, and the employment of a special technical terminology. In the case of an original philosopher, this terminology becomes an artistic creation, highly technical in two ways. First, it embodies the technical terminology which has already grown up around his subject; second, it contains new technical words and phrases, invented for the purpose of expressing his own individual conceptions and constructive theories. As a guide for the analysis and reconstruction of systems, therefore, we require an historical dictionary of philosophy. Elements of such a work are found in Eucken's *Geschichte der philosophischen Terminologie im Umriss* (Leipzic, 1879), and in Baldwin's *The Dictionary of Philosophy and Psychology*. But both these works give us the common meanings of philosophical terms, and not the successive definitions of them by different philosophers. The latter task is attempted in Eisler's *Wörterbuch der philosophischen Begriffe und Ausdrücke* (Berlin, 1899), while Lalande's *Vocabulaire* is an attempt to fix the meaning of present-day philosophical terms. Other works on particular philosophers, such as Bonitz's *Index Aristotelicus* (1870), Ast's *Lexicus Platonicus*, Schutz's *Thomas Lexicon*, and Schmid's *Wörterbuch zum Gebrauch der Kantischen Schriften* (1788) would be useful to consult. The meaning of words, however, in the terminology of a great philosopher, does not remain constant. It varies as new points of view develop in his system; and often purely accidental changes, highly complicated in their origin, are inevitable, as we see, for example, in Kant's use of 'transcendental.' Still more important than this, every real philosophy is organic in its nature; each term can only be understood when all the others are comprehended; each occupies its own individual place in the system. If philosophical systems were merely the logical development of well-defined premises, an abstract method of interpretation might suffice, but, since they are organic and unique, involved and complicated in their premises and their aims, recourse must be had to the facts of the philosopher's life; the development of his philosophical ideas; his personality and temperament; the intellectual motives which inspired his reflection; the history of his times, his country, and his civilization. Although analysis is always useful, therefore, we must recognize that every philosopher is a human personality, a philosophical spirit; that all the influences which have been brought to bear upon him have been mediated, to use Hegel's phrase, by this spirit; that analysis and decomposition are really for the sake of reconstruction and explanation of doctrines for their own sake. One other method of great importance in this connection is that of investigating the relation of a philosophical system to its predecessors. This interaction must not be considered as external and artificial: a philosopher does not passively accept or learn the systems of his predecessors, he reacts to them, remolds them, and gives them a new meaning. Thus the development of an historical system is a spontaneous growth, in which the old is transformed and realized by the new. But the study of the history of philosophy is not only the study of facts, it consists to a large extent in the interpretation of facts, and here the historian has a very difficult task, which involves all his powers of sagacity and penetration. He must not seek to modernize historical systems, nor attempt to over-unify them. He must recognize that each system has an internal, intrinsic value which cannot be reduced to formulae, communicable to others. When the study of history becomes conscious of the methods it employs, it is indispensable, not only for the philosophical education of the mind, but also for constructive philosophical research.

F. W. A. MILLER.

On the Nature of Memory-Knowledge. J. B. BAILLIE. Mind, N.S. XXVI, 103, pp. 249–272.

The question is a logical and not a psychological one, namely, what is the character of the contribution made by memory to the judgments constituting human knowledge. The problem is important because the view has hitherto largely prevailed that knowledge of the present, and especially knowledge of the external world, furnishes us with the criterion of truth. The object to which the memory-judgment refers is a specific part of our past experience, which is regarded as held together in the continuity of the individual. The object is a specific object selected by attention but not necessarily involving the conscious reference to other objects. It is objective in the sense that it transcends our conscious present and remains the same after repeated changes in our individual history. It is not objective in the sense of possessing universality. By the past in memory judgment, is meant *what has been*, in so far as we affirm it as having been what it was because we made it so. By the continuity in memory knowledge, is meant the actual way in which identity and change are blended in the individual experience. This does not necessarily involve precise reference to a time sequence. But this continuity of the individual experience is the essential nature of the specific object in the memory judgment. It is true that we have a vague general 'feeling of continuity' often; but this must not be confused with the continuity of the memory judgment, which is a definite, articulate reference to some specific part of our experience. While it takes effect in the present, the memory judgment refers to the past; and it is the reality of the individual mind as a unity which holds these two factors together. Thus the memory judgment involves an explicit reference to the self, and furnishes a specific way by which self-consciousness may be realized prior to full social consciousness. Psychologists who ascribe self-consciousness exclusively to social experience should take into account facts like memory judgment in which it is always, in a sense, myself that is remembered, by whom the judgment is made, and for whom alone it has significance. The memory judgment is ultimate for knowledge in that one can never get behind it except to fall back upon another memory judgment. Of course the value and certainty of memory knowledge is always contingent. It can never give organized, inferential knowledge but merely collocation and sequence. Still, these isolated judgments convey truth; and no amount of conceptual deduction and disproof can destroy the truth derived from memory knowledge. In conclusion the author points out that no theory of knowledge is adequate which takes its start solely from knowledge of the present or of the external world; also that objectivity cannot be interpreted solely in terms of universal (common) experience; and finally that the recognition of unique, individual judgment as a mode of truth must involve the acceptance of intuition as knowledge and the recognition of the individual as an 'irreducible center of mentality.'

MARIE T. COLLINS.

Les Attitudes mentales et la Mémoire. A. LECLÈRE. Rev.Ph., XLII, 8, pp. 105–151.

Mental attitudes, being identical with consciousness as a 'whole,' influence and determine the recall of memories, which have a certain, relative independence of the particular, successive states of consciousness. This independence is due to the fact that most memories have a certain feeling accompaniment. The psychic elements in consciousness are affective, intellectual and motor, the affective being predominant. Now it is noticeable that mental attitudes or 'total' consciousnesses, as well as most memories, have an affective tonality. When we endeavor to recall a memory, we experience feelings, which are at first, perhaps, very vague and weak, but which gradually become clearer and more intense until they finally perfect and assert themselves, and then the desired memory is recalled. This phenomenon is very significant, for it indicates that the recall has taken place by affective association. This would lead us to conclude that a particular memory is really a past mental attitude, which can be recalled by the feelings connected with it. The affective accompaniment of any memory can thus be regarded as its representative element. Such an affectional association is quite different from a purely intellectual, imaginal one. An association that is entirely intellectual is quite rare, for most intellection has an emotional correlative. Feeling is generally not controlled by intellectual activity since this is the very element which governs recall, automatically or semi-automatically. The fact that some feelings are rejected is due to inhibition by stronger and more active feelings. For man's most habitual state is that of non-reflection and thus the tendency is to gratify instincts and respond to habits. These instincts were fully conscious at some time in the past but became fixed for that very reason. Feelings represent all the possibilities of the recall of memories, while voluntary, intellectual activity is a particular action, expressing a unique, determinate mental fact. For, psychologically, the ego has no power in itself over mental states but simply joins itself to them. The retention of memories depends upon the affective quality of the original experience and upon the capacity of the individual for experiencing feelings. The interest or indifference connected with the original experience may be said to be its affective quality. If the original attitude is indifferent or non-affective, the experience is retained poorly or not at all. Interest or what may be called attention is necessary for retention. A study of a language in which we are interested results in a very rapid comprehension of it, while the reverse is the case when we are indifferent. So interest, which is synonymous with feeling and attention, determines mental attitudes, memory and power of recall. Mental attitudes change with age, for age modifies affectivity. Feelings are very pronounced in children up to the tenth year and any emotional complexes experienced during that period are remembered in after years with startling vividness. For children experience feelings in all their immediacy and fullness, and consequently feelings occupy for them the 'total' consciousness. These early emotive experiences are constantly being called back to consciousness and may dominate the life of a weak individual. The present is nearly always given content from the past, for we scarcely ever improvise. And if one has changed much one remembers with difficulty. It is noticeable that the strife or reconciliation of mental attitudes depends, in part at least, upon æsthetic tastes which are found to be the most stable and fixed of our psychic experiences. The sources of æsthetic appreciation lie so deep and are so numerous that we have neither inclination nor desire to change them and so they become fixed and act as a sort of catalytic agent in the functioning of mental attitudes. The æsthetic tastes, being thus organic, determine whether or not a particular mental attitude shall be formed. Of course there are some very different mental attitudes which do not oppose each other and, in such cases, there may be a great rigidity of æsthetic taste and at the same time very unstable, changing mental attitudes. The phenomenon of recognition takes place by a disintegration of the 'total' consciousness into mental states and the consciousness of self or of the ego, which nearly always has its own affective tinge or accompaniment. This feeling element in the ego or self, having a peculiar, independent quality of its own, comes into opposition with the feelings in the psychic states of consciousness and, by this functioning, the phenomenon of recognition results. This peculiar, independent affective element in the ego can only be explained by the fact that mental attitudes, though continually changing, are also growing and developing and thus a memory in its original, exact form is forgotten and only comes back to us by means of the ego which, by its very strangeness, becomes recognized. Thus recognition is a proof of the growth and development of mental attitudes. It permits us to see memory in function, the recognized present being only what has been. The ego then represents the most personal and intense feelings and is a summation of all past mental attitudes. The motor element in memory plays a but little understood part for it is peculiarly correlated with physiological facts. In regard to intellectual activity, it is found that even most abstract ideas are susceptible of emotion, and the coldest of mental attitudes, if held up to ridicule, soon ceases to be so. Occasionally the ego may transcend its feelings and become purely objective, correcting past illusions and creating great modifications in the present mental attitude. But as this phenomenon occurs very rarely, it may safely be said that the feelings dominate the psychic life by setting up mental attitudes.

EDGAR DE LASKI.

Time as Succession. J. C. WORDSWORTH. Mind, N.S. XXVI, 103, pp. 317–328.

The problem of the article is to show that the idea of time as a succession is a creation of the memory and that in reality the moments of time are no more successive than the parts of space. Three main arguments are advanced in support of this position. (1) The parts of time cannot be successive because they are independent units, all identical in value; whereas a genuine succession must be like the number series, in which each member is of higher value than those preceding it and includes them in itself. (2) If time were a succession, the terms 'present' and 'now' would be meaningless; for no signification could attach to a 'present' lying between two nonentities, past and future. If unextended, such a 'present' would be nothing at all; while if extended, it would exist as a single block of indeterminate length. (3) Lastly, the idea of time as a succession arises from a misconception due to the fact of memory, that our minds contain impressions of events on one side of the present and none on the other. When we reach the conclusion that time as a succession is only a creation of the memory, we come to see that all times are parts of an eternal 'now' and that no one moment can take precedence over another.

MARIE T. COLLINS.

Le rôle des tendances affectives dans l'attention et dans la conscience. E. RIGNANO. Rev. Ph., XLII, 10, pp. 325–344.

There are two types of senses, (1) non-distance receptors; (2) distance receptors. In the first type the arousing of the affective tendency and its satisfaction are practically simultaneous. In the second type the affective tendency is maintained in suspense throughout the series of preparatory acts and reactions which are preliminary to the consummating act in which the satisfaction of the affection is attained. This state of suspense, of unsatisfied desire, can only be accounted for through the opposition of a contrary affective tendency. This contrary tendency is the product of the disappointment and disillusionment resulting from the failure of past consummating acts, which were too hastily instituted under the impulsion of the original affective tendency. It is such a condition of affective contrast which develops that state of affective tendency maintained in suspense and constituting the state of attention. This affective antagonism is revealed in the examination of typical states of attention, from the apparently automatic reactions of lower animals to the subtlest choices of modes of action in the scientific researches of man. The object in attention is thus approached from two different points of view and results of great variety and precision are obtained. Where there is no affective contrast there is no state of attention. This can be seen in cases of sudden or extreme emotion, and in monomania, where hallucinations and illusions are easily aroused. Consciousness is likewise a phenomenon derived directly from the affective tendencies. Psychological investigation shows that the same act may be either conscious or unconscious, although the same group of sensations accompanies each performance of the act. No past psychic state is conscious or unconscious by itself, but only in relation to some present psychic state. This relation consists in the at least partial co-existence of the affective state of the first with that of the second, and the at least partial superposition or fusion of these more or less analogous states. This relation of consciousness may thus be prolonged through a series of acts, of which each member is conscious by reference to another member of the series. It is also quite possible to have two series, related within themselves, but not related to each other. One of these will then be the conscious series, the other the unconscious. This explains the normal condition of dual personality, in which either series may in turn be conscious or unconscious, depending upon the relations of the affective tendencies of the psychic states. In pathological cases of dual personality, each series constitutes a conscious series for one phase of the personality, while remaining an unconscious series for the other. In unusual instances one series may be conscious in relation to a second, while this second will have no consciousness of the first. Consciousness is thus not a psychic state in itself, but the characteristic of a relation between two or more psychic states.

A. M. TOMFOHRDE.

L'evolution dans ses rapports avec l'éthique. A. LYNCH. Rev. Ph., IX, 9, pp. 201–228.

In order to deal successfully with a subject of such range and significance as that of the present article, one must neglect all the theories of the various schools, free oneself from all prejudices, and confine oneself to the general tendencies and the essential principles which alone are really able to provide a criterion of the degree of evolution in its relation to morality. The first requisite is to raise oneself above evolution itself in order to attain a new point of view. Some biologists, because of their remarkable progress in a special field of human knowledge, seem to hold that they have already reached this point of view; having won their reputation in a special field of research, they invest their childish notions of religion, ethics, and philosophy with the sanctity borrowed from this reputation; but does an extended knowledge of the facts of biology necessarily justify dogmatic utterances on philosophical questions? The one way to connect and relate the results of the special scientists in a logical and sensible whole, in which their real meaning becomes apparent, is to abandon the conception that philosophy is a domain of repose, abstracted from life, and to encourage the special scientist himself to become a philosopher. For example, if Darwin's theory of the struggle for existence and 'survival of the fittest' is taken as a philosophical truth, expressing the ultimate nature of the world, it is easily translated by a military bureaucracy, such as exists in Germany, into a justification of war as fulfilling the real purpose of nature. But Darwin was always a scientist, never a philosopher; and, as Huxley has pointed out, his formulæ do not take account of the ability of animals to communicate with each other, their capacity for coöperation, and their faculty of transmitting without interruption ideas from one generation to the next. Further, the principle of the 'survival of the fittest' reduces in the last analysis to a mere tautology, because under any given set of conditions the fittest are those who are able to survive. Herbert Spencer's formula, although it is more comprehensive, is no less inadequate. Simplicity and complexity cannot be taken as terms in the estimation of progress, and thus Spencer leaves us without a criterion of evolution. Whether the physical constitution of man is more complex than that of the animals is an indifferent question. Man is an animal who uses tools, who thinks. These faculties, not possessed by animals, give man the power of controlling the forces of nature, and this is the true criterion of evolution. Systems of controlling and coördinating activity may be developed in many ways, and offer many standards, but if they are evaluated from the point of view of the control of nature, a simple principle of evaluation is supplied. The efficacy of this control may be measured in terms of man's ability to look forward and backward. It reveals science as one of the highest accomplishments of man. But man's intellectual development is always conditioned by his moral development, which forms the basis of society, the main determinant of scientific progress, in which the "Tripod of Ethics,—Truth, Energy, and Sympathy,"—appears as the true principle of the worth of human life.

F. W. A. MILLER.

Les conditions et les limites individuelles du bonheur. G. BAUCHAL. Rev. Ph., XLII, 8, pp. 152–170.

To be happy, the individual must investigate his own personal character and determine his limitations. Happiness is purely an individual affiair; it is referred to no objective standard; religion and virtue are irrelevant to it. To interpret happiness we must then seriously consider the various and diverse types of mankind. The elements of unhappiness or happiness are to be found in the particular, cognitive states of consciousness which, taken in order of their intensity, include emotions, sensations, pleasant and unpleasant sentiments and some unnameable ones. The pleasant emotions are those most favorable to happiness. Every satisfied or unsatisfied inclination gives rise to these various states of consciousness. The robust appetite experiences satisfaction in the various odors of foods while the excesses of the gourmand are accompanied by regret and shame, even though the physiological effects are not felt for some time afterwards. The proper subordination and coördination of inclinations depend upon the individual's scale of values. Such a scale is fundamentally necessary for the happiness of the individual and must depend upon the individual's particular character. For the intellectual, who suppress physical desires, intellectual pursuits occasion the greatest happiness. For the type with superabundant energy and fine health, mediocrity in intellectual matters and in personal ambitions is the desirable attitude. Aptitude and interest in practical affairs when joined with good health is another possible happiness complex. For the chronically sick, an attitude of resignation is most satisfying. It is possible that the same scale of values may be applied to different types, though they would naturally lead to very different consequences. This evaluative judgment is a special faculty which accompanies all states of consciousness, guiding and comparing these states and thus determining them. In other words, this faculty acts as a standard or measure. We can determine graphically by this standard our pleasures and pains for at least a short period of time and guide our lives accordingly. And it is only by means of this self-limitation, that we can hope for happiness.

EDGAR DE LASKI.

Purpose As Systematic Unity. RALPH BARTON PERRY. The Monist, XXVII, 3, pp. 352–375.

An act, in either human or animal conduct, is a purposive act if it involves these three necessary elements: first, a general type of action of which the particular act in question is judged to be a case; secondly, an agent possessed of a stable tendency to perform acts of this type; and, thirdly, a judgment made by the agent that this particular act is a case of the general type. There are several common errors regarding purpose. There is the 'pathetic fallacy' or human weakness which prompts one to extend to all agencies involved in any event that purposive type of determination which really holds only for one's own participation in it. Again, we are often disposed to attribute purpose to any structure that shows systematic unity. This unity may be either existent in an object or objects, as the flavor that pervades any historical period; or it may be ideal, as the universal ellipse which explains any concrete elliptical curve to be an ellipse. However, in neither case is there purpose, for in neither case does the unity determine the existence of the parts. The universal ellipse does not explain the fact that particular elliptical curves exist; nor does the flavor that pervades any historical period determine the existence of the events of that period. It is often argued that since nature shows unity, there must be an agent that designed this unity, just as a watch presupposes a watchmaker. From such reasoning by analogy it follows that the most mechanistic parts of nature would afford the clearest cases of purpose, and man who is least mechanical would be the least a creation of divine design. As a matter of fact, man's inventions are imitations of nature's most mechanistic parts; and if we are to reason by analogy at all, we should proceed from nature to human conduct, rather than from man to nature. Finally, it is commonly reasoned that in proportion as a combination of parts (such as our universe) is remarkable it gives evidence of design. But, unfortunately, when there is only one case of the combination in existence (as is the case with our universe) it makes no difference how heavy the odds are against that particular combination, it may, nevertheless, logically be attributed to mere chance.

JULIUS COHEN.

A Criticism of Coördination as Criterion of Moral Value. HENRY NELSON WIEMAN. J. of Ph., Psy., and Sci. Meth., XIV, 20, pp. 533–542.

Not the coördination, but the organization of interests we consider as the criterion of moral value. This organization may be a moral procedure, for it may be the functioning of several interests as one. Indeed, organized conflict is essential to so moral an interest as the eagerness constantly to extend experience. In the especial case of desiring to extend one's own experience so as to share another's, organization is necessary, for coördination is inadequate. Valuable conflict, however, is internal and not external; for internal conflict, in which one embodies one's opponent's purpose without yielding one's own results is development; whereas external conflict, in which two neural processes are obstructed, is valueless. Furthermore, internal conflict generates creative activity, the necessary condition of which is plasticity of the undetermined association centers. Such plasticity may be affected by ill health or fatigue, or a tendency highly specialized. But the creative interest, which is morality's highest achievement, needs such a problem as conflict presents. In fact, any sensori-motor response which unites diverse qualities is an organized and not a coördinated reaction. Hence, if behavior, to be moral, had to be coördinated, it would be impossible to react to the universe as a unit; and yet, such reaction is necessary from a religious standpoint. Morality seems, then, to require organization as well as coördination of interest.

MARJORIE S. HARRIS.

Kant's Moral Theology. JOHNSTON ESTEP WALTER. Harvard Theological Review, X, 3, pp. 272–295.

Kant rejected the traditional arguments for the existence of God—the ontological, cosmological, and teleological. He gave up these arguments because of their supposed deficiencies; and, by denying the knowableness of realities outside and independent of the mind, he would seem to have abandoned every ground for arguing to a divine cause. Though Kant, therefore, asserts the impossibility of a speculative or scientific knowledge of God, he maintains that there is left to us a noble theism with its foundations in the practical as opposed to the theoretical reason. Accordingly, his moral theology amounts only to this: that we must assume a God as the necessary procurer of happiness for the virtuous, while at the same time we are aware that we have no knowledge of God as a reality. Kant's theism goes counter to his ethics contending as he does in the former that there must be a God to support virtue by holding forth the reward of happiness, and in the latter that men should act purely out of regard for the moral law, irrespectively of happiness. He seems at variance with reality also when he assumes it to be feasible for men to act as if there were a God while disclaiming real knowledge of Him. From these and other reasons, one is led to think Kant's moral theistic proof as oddly conceived and frail an argument as philosopher ever offered for belief in God.

ERNEST BRIDGES.

The Electronic Theory of Matter. WILLIAM BENJAMIN SMITH. The Monist, XXVII, 3, pp. 321–351.

English scientists have demonstrated the fact that the cathode rays in the Crookes tubes are streams of particles, and they have been able to seize the individual corpuscle, to determine its velocity, the amount of its electrical charge, and its mass. The mass of the corpuscle or electron proves to be about 1/1700 of the mass of the smallest atom. Now, all motion takes place in an all-pervading ether. When a body is moving in this ether it also sets the ether itself into motion. The motion or swirl of the ether increases the mass of the moving body. In case of the moving corpuscle the increase in mass due to the swirl of the ether has been found to be $\frac{2}{3}k\,(e^2/r)$. But 'r,' the radius of the corpuscle, is so minute that this increase, or so-called electrical mass, represented by the formula $\frac{2}{3}\,k\,(e^2/r)$ assumes important proportions. Indeed, it has been found that the calculated relative increase in the electrical mass (due to the rising velocity of the corpuscle) is constantly equal to the observed relative increase in the whole mass. Hence we must conclude that the electrical mass of the corpuscle is its whole mass, for if there were any non-electrical mass it would certainly not increase with the increasing velocity. Hence, the mass of the electron is not located (at least in any appreciable degree) in the electron itself, but only in the ether around it. We can, therefore, no longer affirm the principle of the conservation of mass, for masses vary constantly with the velocities of the electrons. In order to establish a relation between the electron and the atom we must recall that there are rays of positive as well as of negative electricity, that are deflected by a magnet oppositely to the negative cathode rays. For them the ratio l/m never exceeds 10,000, which is also the value of hydrogen ions in electrolysis of dilute solutions. It is natural, then, to figure that the positive corpuscle is a sphere of positive electrification about the size of an atom. Such a sphere must have a balancing amount of negative electricity, which we imagine to be distributed throughout the sphere in equal units of negative electricity. And since the atom is permanent, this arrangement must form a system in stable equilibrium. Now, if we name the tendency of such a system to shed a negative electron 'corpuscular pressure, we can deduce the necessary existence of a double system of valency; positive valency being the greatest number of corpuscles an atom can lose without an abrupt fall in corpuscular pressure, and negative valency the greatest number it can gain without a sudden rise in pressure. It now also becomes evident that if all possible forms of such systems or equilibriums should be realized as chemical elements, of necessity these elements would fall into a series; and we are thus brought to the periodic law of Mendelyeev, which now becomes a necessity of the mechanical laws of equilibrium, and not a mere empirical observation. The author further suggests, but does not carry out in detail, some applications of the electronic theory of matter in astronomy, especially in the explanation of such phenomena as comet tails, the corona, the Aurora Borealis, and the *Gegenschein*. Also in biology, the theory of panspermia seems more plausible because of the electronic theory. And who can tell if it may not help to solve the mysteries of Mendelism and Mutation?

JULIUS COHEN.

The Nature of Scientific Matter. STEPHEN C. PEPPER. J. of Ph., Psy., and Sci. Meth., XIV, 18, pp. 483-490.

In the neglected endeavor to reach the 'least common denominator of facts' of scientific matter, there are three stages: a reduction of facts to the data of one sense, thence to units, and thence to elementary units. This common sense, so important in the task of the organization of sensations, is sight. An examination of experiments on sound makes this evident, for where the data are visual, the results are most accurate, whereas only in the neglected subject of loudness are the results solely in terms of auditory data. Furthermore, the tendency is to reduce all facts to visual data, and thence to units. In this second stage there are many sciences, each definable by one or by a few units. Hence a reduction to elementary units is necessary. Already we have two processes working in this direction: the consolidation and differentiation of units which show that the elementary units will be the centimeter, gram, second and radian. Thus sensation is transformed into scientific knowledge through the reduction of crude facts to visual facts, thence to scientific units, and thence to elementary units.

MARJORIE S. HARRIS.

An Attempted Formulation of the Scope of Behavior Psychology. JOHN B. WATSON. Psych. Rev., XXIV, 329-352.

The present article presents the material to be used in the first chapter of the author's forthcoming book, *Human Psychology*. It defines psychology as a science of behavior, having as its goal a formulation, through systematic observation and experimentation, of a series of principles or laws which will enable it to tell with some degree of accuracy how an individual or group of individuals will adjust themselves to the daily situations of life as well as to the uncommon and unusual situations which may confront them. Psychology regarded in this way is something which everyone has been using more or less all his life, without calling it psychology. The practical psychology of control began as soon as there were two individuals on earth living near enough together for the behavior of one to influence the behavior of the other. The serpent controlled Eve's behavior by offering her the delectable apple. Common sense has discovered many truths about behavior by hit-and-miss methods, such as how to draw a crowd, etc. We may gain knowledge of behavior by instituting a known situation and watching the response. Or again, we may obtain data on an unknown situation by watching the response. These two methods are mutually supplementary. In all cases, however, there is great need of acquaintance with the individual's past. Common sense includes a crude but genuine psychology. Psychology is essentially concerned with adjustment to the environment, with stimulus and response. Its goal is, precisely, the ascertaining of such data and laws that, given the stimulus, psychology can predict what the response will be; or, on the other hand, given the response, it can predict the nature of the effective stimulus. Simple controlling factors are properly called stimuli, while combinations of these make up situations. Response has often been considered in terms of needless technicalities and metaphysical concepts, such as purpose and end. Psychology is not concerned with these. Its aim is an unprejudiced study of the individual's reaction possibilities. Under response is to be understood the tota striped and unstriped muscular and glandular changes which follow upon a given stimulation. Responses may be conveniently divided into four classes: (1) explicit habit responses (unlocking a door, tennis playing, violin playing); (2) implicit habit responses (*'thinking,' i. e., subvocal talking*, language habits, general bodily sets and attitudes); (3) explicit instinctive responses (observable instinctive and emotional reactions); (4) implicit instinctive responses (endocrine secretions, circulatory changes). Psychology is very closely related to physiology, but is distinguished from the latter by the fact that physiology deals with the functions of special organs (although not necessarily in isolation from each other), while psychology deals with the responses of the organism as a whole. Where the two sciences overlap their standpoints and methods are identical. Psychology should be of special significance to medicine and psychiatry.

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Relation between Functional and Behavior Psychology. A. P. WEISE. Psych. Rev., XXIV, 5, pp. 353-368.

The concept of evolution in biology led men to seek a psychology which would no longer be content to study the structure of mental states, but would study the development and genesis of mind as well. This led to a functional psychology. But functional psychology is unable to show how mental processes influence neural processes. Thus for those who questioned the causal effectiveness of consciousness the problem became: How can human behavior be understood solely in terms of the receptor-effector processes in the neuromuscular system? Lack of precision on the part of the functionalists led to the differentiation of behaviorism. The functionalists are not the only group of psychologists who write essays rather than scientific expositions, but as long as we excuse ourselves on the ground that others are equally guilty, and persist in substituting rhetoric for science, we should not complain if our work is regarded with suspicion by the biologists. It is the neural correlate of perception which controls action rather than perception itself. Conscious processes follow neural processes rather than lead them. In fact, introspection is simply a minor reaction consisting of speech responses in psychological terminology. Since this minor reaction does not control the major responses, mental processes do not control bodily processes, and there is no problem as to the relation between mind and body. Behaviorism disregards the entity the functionalists call consciousness, and regards the movement which withdraws the hand from the scorching stove as simply one of less complexity than the movements of the pen which signs a treaty between nations.

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